



FLUID FLOW AND MUD VOLCANISM IN THE EASTERN MEDITERRANEAN INCIPIENT COLLISION ZONES

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Fluid venting activity, either coupled with mud volcanism or along deep active faults or both, has been investigated in the Eastern Mediterranean Sea, mainly in two areas associated with the incipient collision process between Africa and Eurasia. Mud volcanoes are abundant on the crestal part of the Mediterranean Ridge accretionary prism, in association with thrusts, back-thrusts and transcurrent features. They are also found in the Anaximander Mountains/Florence Rise area, to the west of Cyprus, where a wrench system accommodates the pre-collisional deformation. Combined swath multibeam bathymetry and imagery, seismic profiling (ANAXIPROBE survey, 1995 and PRISMED II survey, 1998) and O.R.E.Tech sidescan sonar data (MEDINETH survey, 1999) indicate the genetic relationship between mud volcanoes and tectonics, particularly potential influence of strike-slip faulting. The in situ observations of mud volcanoes (MEDINAUT survey, 1998) have revealed common characteristics at cold seeps, such as carbonate crust constructions and specific chemosynthetic-based fauna. Ground-truth of the sonar data shows that the geophysical signature of mud volcanoes may be related to spatial and temporal evolution of mud volcanism activity, because the seafloor characteristics (surface of the mud flows, distribution and nature of the crusts) and the degree of colonization by benthic fauna vary with the intensity and age of the fluid seepage. Moreover, clay mineralogy studies on the mud matrix samples give insights into the depositional environment, age, and depth of the lithological unit from which the mud breccia is extruded. The shallow signature of the mud reservoir tends to indicate that the overpressured fluids originate from deeper strata than the solid phase of the expelled material.